

Claims

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1. A method for identifying a compound that modulates the expression or activity of a *daf-18* gene, comprising:

- 5 (a) providing a cell expressing a *daf-18* gene; and
(b) contacting said cell with a candidate compound, an alteration in *daf-18* expression or activity following contact with said candidate compound identifying a modulatory compound.

2. A method for identifying a compound that modulates the expression or activity of a *daf-18* gene, comprising:

- 10 (a) providing a cell comprising a mutation in a *daf-18* gene;
(b) expressing in said cell a mammalian DAF-18 homologue; and
(c) contacting said cell with a candidate compound, an alteration in said mammalian DAF-18 expression or activity following contact with said candidate compound identifying a modulatory compound.

15 2. The method of claim 1 or 2, wherein said compound increases *daf-18* expression or activity and is therefore capable of increasing longevity of a cell or organism.

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20 3. The method of claim 1 or 2, wherein said compound decreases *daf-18* activity and is capable of treating an impaired glucose tolerance condition or obesity.

4. The method of claim 1 or 2, wherein said method is carried out in a transgenic animal.

5. The method of claim 4, wherein said animal is a nematode.

6. The method of claim 4, wherein said animal is a mouse.

5 7. The method of claim 2, wherein said DAF-18 homologue is a human homologue.

8. The method of claim 7, wherein said DAF-18 homologue is PTEN.

9. A method for identifying a compound that is capable of ameliorating or delaying an impaired glucose tolerance condition or obesity, comprising
10 contacting a biological sample with a candidate compound and assaying said sample for DAF-18-mediated lipid phosphatase activity, a decrease in said activity indicating a compound capable of ameliorating or delaying an impaired glucose tolerance condition or obesity.

10. A method for identifying a compound that is capable of increasing
15 longevity of a cell or organism, comprising contacting a biological sample with a candidate compound and assaying said sample for DAF-18-mediated lipid phosphatase activity, an increase in said activity indicating a compound capable of increasing longevity of a cell or organism.

11. A method for identifying a compound that is capable of ameliorating or delaying an impaired glucose tolerance condition or obesity, comprising contacting a biological sample with a candidate compound and assaying said sample for PTEN-mediated lipid phosphatase activity, a decrease in said activity indicating a compound capable of ameliorating or delaying an impaired glucose tolerance condition or obesity.

12. A method for identifying a compound that is capable of increasing longevity of a cell or organism, comprising contacting a biological sample with a candidate compound and assaying said sample for PTEN-mediated lipid phosphatase activity, an increase in said activity indicating a compound capable of increasing longevity of a cell or organism.

13. The method of claim 9 or 11, wherein said method further comprises assaying said compound in a cell which comprises a mutation in a *daf-18* gene and which expresses a mammalian DAF-18 homologue, a decrease in DAF-18 activity indicating a compound capable of treating an impaired glucose tolerance condition or obesity.

14. The method of claim 10 or 12, wherein said method further comprises assaying said compound in a cell which comprises a mutation in a *daf-18* gene and which expresses a mammalian DAF-18 homologue, an increase in DAF-18 activity indicating a compound capable of increasing longevity of a cell or organism.

15. The method of claim 13, wherein said mammalian DAF-18 homologue is human PTEN.

16. The method of claim 14, wherein said mammalian DAF-18 homologue is human PTEN.

5 17. A method of diagnosing an impaired glucose tolerance condition, obesity, or a propensity thereto in a patient, said method comprising analyzing the level of PTEN expression or activity in a sample isolated from said patient, whereby an increase in said level of PTEN expression or activity relative to a control sample is an indication of an impaired glucose tolerance condition, obesity,
10 or a propensity thereto.

18. A method of diagnosing longevity in a patient, said method comprising analyzing the level of PTEN expression or activity in a sample isolated from said patient, whereby a decrease in said level of PTEN expression or activity relative to a control sample is an indication of decreased longevity.

15 19. A method of ameliorating or delaying the onset of an impaired glucose tolerance condition in a patient, said method comprising administering to said patient a therapeutically-effective amount of a compound that decreases PTEN expression or activity.

20 20. A method of increasing longevity in a patient, said method comprising administering to said patient a therapeutically-effective amount of

PTEN polypeptide or a compound that increases PTEN expression or activity.

21. The method of claim 19 or 20, wherein said PTEN is human PTEN.

22. A transgenic non-human animal whose cells contain a transgene encoding a mammalian PTEN polypeptide.

5 23. The transgenic animal of claim 22, wherein said animal is a nematode.

24. The transgenic animal of claim 23, wherein said animal carries a mutation in a *daf-18* gene.

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